

specialized RNAi pathway may contribute to its non-cell autonomous activity, as they accumulate outside their discrete regions of biogenesis. We propose that small RNAs can possibly function as mobile inductive signals to direct patterning events during development.

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Program/Abstract # 402

Early zygotic gene regulatory network for epidermis in the ascidian *C. intestinalis*

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The epidermis is the principal interface between an animal and its environment, and generally the largest organ system. Basic epidermal cell specification in ascidians is initiated by maternal determinants. However, the early zygotic homeobox transcription factor *CiDII-B* has been shown to regulate a number of epidermal target genes, suggesting that it is a pivotal element in the epidermal cell specification network. *CiDII-B* is also one of the earliest genes to be expressed throughout, but restricted to, non-neural ectoderm. A misexpression transgene, using *CiFoxA-a* regulatory DNA to drive expression in non-epidermal territories downregulates the expression of a reporter transgene driven by the same regulatory DNA. This suggests that an additional function of *CiDII-B* may be to repress transcription of genes, such as *FoxA-a*, inappropriate to epidermis. *CiDII-B* upstream and intergenic cis-regulatory elements have been located which drive robust expression of reporter transgenes in the endogenous *CiDII-B* territory. This cis-regulatory DNA is being used to manipulate expression of a dominant negative form of *CiDII-B* to test the effect of downregulation of *DII-B* on putative target genes, the aim being to build an understanding of the epidermal gene regulatory network in this simple chordate.

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Program/Abstract # 403

The *C. elegans* *tailless* ortholog *nhr-67* functions in uterus and tail development

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The *tailless* family of nuclear receptors is highly conserved among animals. In *Drosophila*, *tailless* (*tll*) functions in terminal embryonic patterning and central nervous system development. In vertebrates, *Tlx* functions in the maintenance of neural stem cell identity, but does not play a known role in terminal patterning. The *C. elegans* *tll* ortholog, *nhr-67*, is expressed in a dynamic pattern in pre-uterine cells. *nhr-67* is initially expressed in the 4 pre-VU cells, whose progeny form much of the uterus. *nhr-67* is upregulated in one of these four cells, the anchor cell (AC), in response to a *lin-12/Notch* reciprocal signaling system. During the L3 stage, *nhr-67* expression is maintained at high levels in the AC and at low levels in the six π cells whose twelve progeny form cells of the adult ventral uterus. Development of the π cells also depends on a *lin-12/Notch*-based signal from the AC. The development of the π cells is defective in *nhr-67* mutants, but the AC appears normal. Genetic analysis demonstrates that *nhr-67* functions downstream of *lin-12* in the ventral uterus. We are characterizing the

nature of the *nhr-67* uterus defect by electron microscopy. Strong alleles of *nhr-67* arrest development in the L1 after hatching. The arrested larvae display tail defects in the hyp10 epithelial cell similar to those caused by mutations in the cadherin gene *cdh-3*. This observation suggests that a function for *tailless* in terminal development may be conserved among the ecdysozoa.

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Program/Abstract # 404

Drosophila CtBP causes local inhibition of Dorsal and dCBP that regulate neuroectoderm genes

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Transcriptional repression mediated by *Drosophila* C-terminal Binding Protein (dCtBP) together with the DNA-binding repressor Snail specifies mesoderm by excluding the neuroectodermal fate in the early embryo. dCtBP interacts with Snail through the PxDLS amino acid motifs and acts as a corepressor. The Snail/dCtBP repressor complex is only able to repress adjacent activators located within 100 bp. In the last meeting, we presented the first analysis of the molecular mechanisms by which dCtBP mediates this short-range repression at the chromatin level. Particularly, we showed using chromatin immunoprecipitation (ChIP) assays that (a) the Snail/dCtBP complex locally inhibits the DNA-binding of the Dorsal activator to a neuroectodermal enhancer that are regulated by both Snail and Dorsal, but (b) recruitment of Dorsal's coactivator dCBP is not prevented, and that (c) histone H4 is, however, hypo-acetylated. These data suggested that dCtBP acts by locally preventing DNA-binding of adjacent activators, possibly by inhibiting dCBP's HAT activity. We are currently testing whether this is employed for regulation of other neuroectodermal enhancers. In addition, we are extending ChIP assays to core promoter factors to understand how the neuroectodermal enhancer when repressed by the Snail/dCtBP complex communicates with its core promoter. We are testing promoter-enhancer interaction using Chromosome Conformation Capture assay. These experiments should provide details on the molecular mechanisms of dCtBP-mediated short-range repression.

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Program/Abstract # 405

Dispensable function of the B' regulatory subunit of Protein Phosphatase 2A (PP2A) in *Drosophila melanogaster*

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PP2A is a major serine/threonine phosphatase that has roles in diverse processes from gene regulation, protein syntheses to cytoskeleton organization. PP2A is proposed to dephosphorylate and activate the HOX protein Sex combs reduced (SCR). SCR is required for development of the larval first thoracic and labial segments, and the adult first thoracic segment and proboscis formation in *Drosophila melanogaster*. PP2A activity is composed of a set of enzymes that are composed of common catalytic and core subunit, and distinct regulator subunits. One of the regulatory subunits, B' interacts with the homeo-domain of SCR (Berry and Gehring 2000). Using FLP-mediated site specific recombination I created a complete deletion of the PP2A-B' coding sequence. To our surprise, flies homozygous for the deletion were viable and wild type in appearance. We did not observe a large